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Supplementary Tables

Supplementary Table 1: Analysis of Variants within CpG Islands (MAF ≤ 5%)

CpG Island	Nearest Gene	Probe	nVars	P-value
chr3:142315171..142315567	*PLS1*	cg20824294	2	2.86×10^{-19}
chr16:88883056..88883461	*GALNS*	cg00230183	5	3.55×10^{-16}
chr16:67427284..67428950	*ZDHHC1*	cg27539214	5	5.83×10^{-16}
chr2:241529962..241530345	*CAPN10*	cg26250154	2	9.74×10^{-16}
chr16:67233032..67233862	*ELMO3*	cg08721338	2	2.25×10^{-15}
chr18:75690494..75690901	*BDP1P*	cg20484215	3	2.08×10^{-14}
chr18:74114551..74114791	*ZNF516*	cg24786174	3	2.36×10^{-14}
chr14:64108343..64108952	*WDR89*	cg14387360	6	4.12×10^{-14}
chr7:36010997..36011407	*PP13004*	cg08837626	2	5.95×10^{-14}
chr17:62339803..62340799	*TEX2*	cg22194188	2	1.29×10^{-13}

Supplementary Table 2: Analysis of Variants within CpG Islands, Shores & Shelves (MAF ≤ 5%)

CpG Island, Shores & Shelves	Nearest Gene	Probe	nVars	P-value
chr1:155260318..155269536	*PKLR*	cg08949192	12	1.11×10^{-23}
chr8:144713866..144722798	*ZNF623*	cg16316162	4	2.48×10^{-23}
chr10:835608..844210	*LARP4B*	cg10556349	9	3.65×10^{-22}
chr21:45726220..45734444	*PFKL*	cg21069494	8	1.75×10^{-21}
chr16:67139282..67147827	*C16orf70*	cg00510320	9	9.10×10^{-21}
chr3:53074956..53085101	*RFT1*	cg04865290	14	1.21×10^{-20}
chr21:48083200..48092106	*PRMT2*	cg24877093	13	1.28×10^{-20}
chr11:47611710..47620055	*C1QTNF4*	cg04721828	10	1.11×10^{-18}
chr2:128346285..128354640	*MYO7B*	cg01966334	12	1.29×10^{-18}
chr2:196517555..196526950	*SLC39A10*	cg19655195	14	1.66×10^{-18}

Supplementary Table 3: Analysis of Variants within CpG Islands (MAF ≤ 1%)

CpG Island	Nearest Gene	Probe	nVars	P-value
chr16:3550773..3551274	*CLUAP1*	cg27559562	3	4.08×10^{-10}
chr4:129208297..129209780	*PGRMC2*	cg13841734	4	4.33×10^{-09}
chr7:148982079..148982675	*ZNF783*	cg06818605	2	1.05×10^{-08}
chr14:65438412..65439363	*FNTB*	cg10534904	2	9.25×10^{-08}
chr16:89237944..89238331	*CDH15*	cg00511475	2	1.61×10^{-07}
chr15:42371634..42371842	*PLA2G4D*	cg13762474	2	3.48×10^{-07}
chr13:41495776..41496213	*TPTE2P5*	cg22658229	3	4.02×10^{-07}
chr3:195488595..195489381	*MUC4*	cg00789671	4	4.11×10^{-07}
chr3:155461917..155462561	*PLCH1*	cg12679230	2	1.19×10^{-06}
chr8:142401533..142402494	*PTP4A3*	cg12873476	3	1.56×10^{-06}

Supplementary Table 4: Analysis of Variants within CpG Islands & Shores (MAF ≤ 1%)

CpG Island & Shores	Nearest Gene	Probe	nVars	P-value
chr2:233243999..233248448	*ALPP*	cg16700265	3	3.62×10^{-17}
chr16:69758293..69762506	*NQO1*	cg19194454	4	2.35×10^{-14}
chr2:109400907..109405566	*CCDC138*	cg14300730	7	2.95×10^{-14}
chr2:109063509..109067954	*GCC2*	cg14300730	6	4.44×10^{-14}
chr1:1281933..1287345	*DVL1*	cg02279987	2	6.26×10^{-14}
chr1:215738507..215743266	*KCTD3*	cg12133444	3	1.10×10^{-13}
chr2:109333768..109338670	*RANBP2*	cg14300730	6	1.96×10^{-13}
chr1:45985163..45989803	*PRDX1*	cg03335125	9	4.05×10^{-12}
chr22:46260065..46265747	*ATXN10*	cg12301347	5	4.44×10^{-12}
chr1:46267099..46271820	*MAST2*	cg03335125	4	9.58×10^{-12}

Supplementary Table 5: Analysis of Variants within CpG Islands, Shores & Shelves (MAF ≤ 1%)

CpG Island, Shores & Shelves	Nearest Gene	Probe	nVars	P-value
chr16:69756293..69764506	*NQO1*	cg19194454	4	2.35×10^{-14}
chr1:215736507..215745266	*KCTD3*	cg12133444	5	2.99×10^{-13}
chr18:76318675..76327015	*ATP9B*	cg21199045	9	6.19×10^{-12}
chr1:220917411..220926176	*C1orf115*	cg19030620	9	2.04×10^{-11}
chr7:87501100..87510493	*SLC25A40*	cg26365742	7	4.36×10^{-11}
chr22:40053941..40062844	*CACNA1I*	cg18436500	4	4.78×10^{-11}
chr6:5998471..6009125	*NRN1*	cg09986316	5	8.13×10^{-11}
chr15:69587246..69595754	*PAQR5*	cg00642615	5	8.15×10^{-11}
chr6:43138013..43146217	*SRF*	cg20227255	2	1.14×10^{-10}
chr2:21262669..21270961	*APOB*	cg07636176	2	1.72×10^{-10}

Individual Effects

Supplementary Table 6: Individual effects for CpG Islands results (MAF ≤ 5%)

CpG Island	Nearest Gene	Probe	nVars	P-value	Individual effects
chr3:142315171..142315567	*PLS1*	cg20824294	2	2.86E-19	rs112514146 (3.05E-11), rs192275612 (4.44E-11)
chr16:88883056..88883461	*GALNS*	cg00230183	5	3.55E-16	rs147207266 (0.04), rs112609821 (9.09E-11), rs117938568 (0.54), rs79554382 (9.09E-11), rs72813559 (4.76E-13)
chr16:67427284..67428950	*ZDHHC1*	cg27539214	5	$5.83x10^{-16}$	rs114529082 (1.18E-14), rs9922191 (0.45), rs78558968 (1.24E-03), rs145348547 (1.18E-14), rs117132786 (1.48E-03)
chr2:241529962..241530345	*CAPN10*	cg26250154	2	$9.74x10^{-16}$	rs72999976 (2.21E-05), rs182360139 (7.31E-14)
chr16:67233032..67233862	*ELMO3*	cg08721338	2	2.25E-15	rs75193761 (1.50E-06), rs8058614 (1.86E-11)
chr18:75690494..75690901	*BDP1P*	cg20484215	3	2.08E-14	rs11661975 (0.71), rs7506894 (2.21E-14), rs138928621 (3.45E-14)
chr18:74114551..74114791	*ZNF516*	cg24786174	3	2.36E-14	rs35943460 (1.70E-05), rs117145635 (1.85E-05), rs141520495 (1.64E-08)
chr14:64108343..64108952	*WDR89*	cg14387360	6	4.12E-14	rs8018194 (6.75E-14), rs8018382 (1.38E-14), rs185458911 (0.99), rs10498511 (1.38E-14), rs61985669 (1.38E-14), rs8018872 (1.38E-14)
chr7:36010997..36011407	*PP13004*	cg08837626	2	5.95E-14	rs140384299 (3.99E-14), rs1962367 (1.92E-14)
chr17:62339803..62340799	*TEX2*	cg22194188	2	1.29E-13	rs9895312 (5.53E-14), rs112866441 (5.53E-14)

Supplementary Table 7: Individual effects for CpG Islands results (MAF ≤ 1%)

CpG Island	Nearest Gene	Probe	nVars	P-value	Individual effects
chr16:3550773..3551274	*CLUAP1*	cg27559562	3	$4.08x10^{-10}$	rs111497094 ($5.88x10^{-04}$), rs115697151 ($1.59x10^{-09}$), rs192397963 (0.31)
chr4:129208297..129209780	*PGRMC2*	cg13841734	4	$4.33x10^{-09}$	rs3733261 ($4.85x10^{-09}$), rs41298551 ($4.85x10^{-09}$), rs41298547 (0.32), rs41298545 ($6.45x10^{-09}$)
chr7:148982079..148982675	*ZNF783*	cg06818605	2	$1.05x10^{-08}$	rs112616806 ($4.47x10^{-09}$), rs138890106 (0.16)
chr14:65438412..65439363	*FNTB*	cg10534904	2	$9.25x10^{-08}$	rs184621947 (0.15), rs188596757 ($4.29x10^{-03}$)
chr16:89237944..89238331	*CDH15*	cg00511475	2	$1.61x10^{-07}$	rs190099280 ($1.32x10^{-07}$), rs117273249 ($8.17x10^{-04}$)
chr15:42371634..42371842	*PLA2G4D*	cg13762474	2	$3.48x10^{-07}$	rs75210712 ($2.92x10^{-07}$), rs112756552 ($2.92x10^{-07}$)
chr13:41495776..41496213	*TPTE2P5*	cg22658229	3	$4.02x10^{-07}$	rs77750044 ($3.38x10^{-07}$), rs111433219 ($3.38x10^{-07}$), rs74242796 ($3.38x10^{-07}$)
chr3:195488595..195489381	*MUC4*	cg00789671	4	$4.11x10^{-07}$	rs115531913 ($3.46x10^{-07}$), rs116085423 ($3.46x10^{-07}$), rs76394037 ($3.46x10^{-07}$), rs147056758 ($3.46x10^{-07}$)
chr3:155461917..155462561	*PLCH1*	cg12679230	2	$1.19x10^{-06}$	rs139489498 (0.02), rs58689622 ($3.46x10^{-06}$)
chr8:142401533..142402494	*PTP4A3*	cg12873476	3	$1.56x10^{-06}$	rs7830943 ($1.48x10^{-06}$), rs67017417 ($2.34x10^{-06}$), rs72660242 ($1.48x10^{-06}$)

Supplementary Table 8: Individual effects for CpG Islands & Shores results (MAF ≤ 5%)

CpG Island & Shores	Nearest Gene	Probe	nVars	P-value	Individual effects
chr21:45728220..45732444	*PFKL*	cg21069494	6	$6.24x10^{-24}$	rs150947529 (9.11E-07), rs183612767 (0.82), rs113934313 (7.00E-03), rs140395625 (1.33E-12), rs144344436 (0.07), rs78931138 (1.44E-08)
chr8:144715866..144720798	*ZNF623*	cg16316162	3	$4.02x10^{-23}$	rs144074829 (1.28E-12), rs149005143 (4.09E-14), rs2384928 (0.33)
chr11:66492937..66498387	*SPTBN2*	cg24851651	6	$2.68x10^{-21}$	rs117612543 (0.36), rs479261 (1.25E-10), rs190683929 (0.12), rs138549284 (0.99), rs145618970 (0.02), rs117239013 (2.49E-12)
chr2:75785717..75790312	*EVA1A*	cg26175789	9	$6.73x10^{-21}$	rs80132995 (1.30E-08), rs116763000 (0.78), rs114883774 (4.46E-04), rs78222446 (4.46E-04), rs114973170 (8.07E-04), rs76553177 (0.07), rs113609413 (1.17E-12), rs116453138 (4.06E-03), rs72816744 (7.31E-05)
chr12:120753346..120757672	*PLA2G1B*	cg06379361	5	$1.21x10^{-20}$	rs148928469 (1.33E-11), rs141183115 (0.97), rs137933811 (9.48E-11), rs147288206 (0.97), rs140911250 (7.54E-04)
chr7:100873555..100878212	*CLDN15*	cg01299997	7	$1.26x10^{-20}$	rs11773455 (0.96), rs115611906 (7.78E-12), rs183990374 (0.55), rs144733493 (1.28E-09), rs143800908 (0.56), rs80277788 (0.37), rs77731918 (1.50E-03)
chr3:53076956..53083101	*RFT1*	cg04865290	10	$2.03x10^{-20}$	rs183255344 (0.39), rs74380125 (3.83E-13), rs116211523 (0.70), rs142052001 (0.71), rs200910296 (2.10E-09), rs3806693 (0.39), rs189440791 (0.39), rs114006553 (0.14), rs186372583 (0.39), rs180738561 (0.39)
chr2:196519555..196524950	*SLC39A10*	cg19655195	8	$2.23x10^{-20}$	rs181029438 (6.63E-05), rs1371122 (3.01E-12), rs181591378 (0.19), rs116877579 (0.02), rs10184777 (1.71E-11), rs3738940 (0.02), rs78456147 (0.07), rs6719584 (9.54E-13)
chr1:1287707..1293126	*MXRA8*	cg17132079	3	$1.11x10^{-19}$	rs13249 (3.76E-14), rs147405504 (0.02), rs202220998 (2.54E-07)
chr11:64407877..64413253	*NRXN2*	cg19395706	4	$1.43x10^{-19}$	rs57387921 (2.12E-14), rs71579882 (6.03E-09), rs71579879 (0.40), rs11820322 (2.12E-14)

Supplementary Table 9: Individual effects for CpG Islands & Shores results (MAF ≤ 1%)

CpG Island & Shores	Nearest Gene	Probe	nVars	P-value	Individual effects
chr2:233243999..233248448	*ALPP*	cg16700265	3	3.62×10^{-17}	rs150558405 (4.17E-09), rs73001984 (0.26), rs181094685 (6.21E-11)
chr16:69758293..69762506	*NQO1*	cg19194454	4	2.35×10^{-14}	rs71534273 (0.13), rs117928302 (9.76E-14), rs111555725 (0.13), rs141281805 (0.45)
chr2:109400907..109405566	*CCDC138*	cg14300730	7	2.95×10^{-14}	rs10164715 (0.65), rs58791443 (0.48), rs10195166 (0.48), rs146848524 (1.22E-14), rs139590986 (1.22E-14), rs149132027 (1.22E-14), rs79377757 (1.22E-14)
chr2:109063509..109067954	*GCC2*	cg14300730	6	4.44×10^{-14}	rs191654036 (0.15), rs142672792 (0.54), rs147355200 (6.34E-14), rs76672099 (6.34E-14), rs115218746 (6.34E-14), rs146969797 (6.34E-14)
chr1:1281933..1287345	*DVL1*	cg02279987	2	6.26×10^{-14}	rs145425222 (2.15E-12), rs113488343 (7.45E-09)
chr1:215738507..215743266	*KCTD3*	cg12133444	3	1.10×10^{-13}	rs76551420 (8.60E-14), rs80018194 (8.60E-14), rs141935194 (0.77)
chr2:109333768..109338670	*RANBP2*	cg14300730	6	1.96×10^{-13}	rs184224507 (1.22E-14), rs139400907 (0.48), rs113447280 (0.48), rs143297644 (0.48), rs62151247 (0.21), rs59221702 (0.48)
chr1:45985163..45989803	*PRDX1*	cg03335125	9	4.05×10^{-12}	rs6664588 (0.69), rs6677135 (0.69), rs34181355 (0.69), rs34426720 (0.19), rs148195562 (5.37E-13), rs146962773 (0.69), rs12066809 (0.69), rs12065695 (0.69), rs202109079 (0.69)
chr22:46260065..46265747	*ATXN10*	cg12301347	5	4.44×10^{-12}	rs136041 (8.72E-06), rs136042 (6.75E-06), rs183318428 (5.12E-12), rs78345649 (5.12E-12), rs80114170 (6.43E-11)
chr1:46267099..46271820	*MAST2*	cg03335125	4	9.58×10^{-12}	rs76912510 (1.22×10^{-04}), rs151010228 (2.52×10^{-10}), rs150406727 (0.54), rs35106493 (0.92)

Supplementary Table 10: Individual effects for CpG Islands, Shores & Shelves results (MAF ≤ 5%)

CpG Island, Shores & Shelves	Nearest Gene	Probe	nVars	P-value	Individual effects
chr1:155260318..155269536	*PKLR*	cg08949192	12	1.11×10^{-23}	rs191588587 (0.29), rs8177992 (0.15), rs8177988 (3.34E-03), rs3762272 (3.84E-05), rs139885057 (0.12), rs8177971 (2.34E-08), rs138344553 (3.03E-09), rs142339464 (3.03E-09), rs115736167 (7.07E-07), rs112966658 (9.43E-03), rs180921974 (5.75E-06), rs186226317 (4.94E-03)
chr8:144713866..144722798	*ZNF623*	cg16316162	4	2.48×10^{-23}	rs144074829 (1.28E-12), rs149005143 (4.09E-14), rs2384928 (0.33), rs4873813 (0.33)
chr10:835608..844210	*LARP4B*	cg10556349	9	3.65×10^{-22}	rs186726285 (2.66E-06), rs114850712 (1.61E-09), rs117535965 (2.03E-04), rs142571536 (7.15E-08), rs117257789 (0.07), rs7916656 (0.17), rs117479624 (1.71E-06) rs116727192 (1.61E-09), rs140695858 (3.57E-04)
chr21:45726220..45734444	*PFKL*	cg21069494	8	1.75×10^{-21}	rs117689677 (4.36E-03), rs150947529 (9.11E-07), rs183612767 (0.82), rs113934313 (7.00E-03), rs140395625 (1.33E-12), rs144344436 (0.07), rs78931138 (1.44E-08), rs143345133 (6.59E-04)
chr16:67139282..67147827	*C16orf70*	cg00510320	9	9.10×10^{-21}	rs74932341 (5.34E-10), rs76764655 (9.46E-14), rs185272357 (0.10), rs115599330 (0.30), rs1881466 (1.36E-10), rs8052623 (0.17), rs17618203 (9.46E-14), rs189409766 (0.87), rs140868667 (1.36E-10)
chr3:53074956..53085101	*RFT1*	cg04865290	14	1.21×10^{-20}	rs183255344 (0.39), rs74380125 (3.83E-13), rs116211523 (0.70), rs142052001 (0.71), rs200910296 (2.10E-09), rs3806693 (0.39), rs189440791 (0.39), rs114006553 (0.14), rs186372583 (0.39), rs180738561 (0.39), rs138412876 (0.70), rs192671668 (0.39), rs141046534 (0.31), rs141518615 (0.39)

chr21:48083200..48092106	*PRMT2*	cg24877093	13	$1.28x10^{-20}$	rs76187868 (1.06E-03), rs149520727 (0.66), rs117282473 (1.89E-03), rs79726879 (0.42), rs117164191 (3.06E-03), rs117073279 (0.19), rs145906853 (8.59E-04), rs9306158 (1.26E-03), rs2839379 (2.03E-11), rs187437953 (2.03E-11), rs59497292 (5.88E-04), rs141423093 (0.32), rs112771868 (4.60E-08)
chr11:47611710..47620055	*C1QTNF4*	cg04721828	10	$1.11x10^{-18}$	rs150142619 (5.99E-03), rs11601694 (1.15E-11), rs112190302 (0.69), rs149860042 (0.14), rs118102336 (8.71E-10), rs149175346 (9.56E-11), rs151202997 (0.28), rs73463785 (0.86), rs111955624 (0.69), rs4752852 (0.69)
chr2:128346285..128354640	*MYO7B*	cg01966334	12	$1.29x10^{-18}$	rs114134373 (0.84), rs114950198 (0.03), rs183049678 (4.11E-09), rs4662584 (0.01), rs115500899 (4.11E-09), rs79437920 (0.49), rs72843363 (4.05E-09), rs111804739 (2.53E-04), rs59486761 (2.25E-09), rs17340406 (5.21E-09), rs72843365 (9.24E-03), rs112316764 (0.65)
chr2:196517555..196526950	*SLC39A10*	cg19655195	14	$1.66x10^{-18}$	rs58650718 (0.02), rs143105938 (8.15E-05), rs184788263 (0.60), rs141335019 (1.71E-11), rs181029438 (6.63E-05), rs1371122 (3.01E-12), rs181591378 (0.19), rs116877579 (0.02), rs10184777 (1.71E-11), rs3738940 (0.02), rs78456147 (0.07), rs6719584 (9.54E-13), rs13489 (4.42E-06), rs10171083 (1.71E-11)

Supplementary Table 11: Individual effects for CpG Islands, Shores & Shelves results (MAF ≤ 1%)

CpG Island, Shores & Shelves	Nearest Gene	Probe	nVars	P-value	Individual effects
chr16:69756293..69764506	*NQO1*	cg19194454	4	2.35E-14	rs190237675 (0.51), rs71534273 (0.13), rs117928302 (9.76E-14), rs111555725 (0.13)
chr1:215736507..215745266	*KCTD3*	cg12133444	5	2.99E-13	rs193052948 (4.86E-12), rs76551420 (8.60E-14), rs80018194 (8.60E-14), rs141935194 (0.77), rs59026507 (8.60E-14)
chr18:76318675..76327015	*ATP9B*	cg21199045	9	6.19E-12	rs117161401 (0.19), rs117600463 (0.55), rs12954375 (0.82), rs28720977 (0.89), rs73972232 (1.07E 09), rs114357617 (0.97), rs80324891 (0.57), rs77501012 (0.55), rs73972233 (7.16E-13)
chr1:220917411..220926176	*C1orf115*	cg19030620	9	2.04E-11	rs72472366(1.17E-11), rs78814532 (1.17E-11), rs74487083 (1.17E-11), rs12023149 (1.17E-11), rs2172700 (0.73), rs75917278 (1.17E-11), rs80115160 (1.17E-11), rs2172699 (0.73), rs114783097 (0.06)
chr7:87501100..87510493	*SLC25A40*	cg26365742	7	4.36E-11	rs117188385 (0.16), rs10280397 (0.71), rs79810525 (3.23E-12), rs117953527 (0.28), rs150166460 (0.87), rs142344486 (0.32), rs111815979 (0.32)
chr22:40053941..40062844	*CACNA1I*	cg18436500	4	4.78E-11	rs57299573 (8.24E-14), rs58021347 (0.66), rs117956704 (0.61), rs139876154 (0.77)
chr6:5998471..6009125	*NRN1*	cg09986316	5	8.13×10^{-11}	rs140163412 (2.22×10^{-05}), rs184320557 (0.26), rs114224069 (3.80×10^{-03}), rs79453941 (0.02), rs114396677 (1.39×10^{-11})
chr15:69587246..69595754	*PAQR5*	cg00642615	5	8.15×10^{-11}	rs73437176 (0.08), rs76909122(0.08), rs111668944 (7.76×10^{-11}), rs4776438 (0.06), rs117586126 (0.24)
chr6:43138013..43146217	*SRF*	cg20227255	2	1.14×10^{-10}	rs192971989 (1.02×10^{-10}), rs112496612 (0.08)
chr2:21262669..21270961	*APOB*	cg07636176	2	1.72×10^{-10}	rs72653053 (0.15), rs1800480 (1.28×10^{-10})

Trans-effects

Supplementary Table 12: Trans-effects for CpG Islands & Shores (MAF ≤ 5%)

CpG Islands & Shores	Nearest Gene	Probe	Probe location	Nearest Gene to Probe	nVars	P-value
chr21:33982367..33987450	*C21orf59*	cg09050820	chr6:167586206	*TCP10L2*	9	1.50×10^{-15}
chr11:47613710..47618055	*C1QTNF4*	cg17212184	chr11:89787638	*TRIM49C*	7	8.98×10^{-14}
chr11:47609138..47614438	*C1QTNF4*	cg13118410	chr11:49839281	*OR4C13*	7	2.53×10^{-13}
chr1:174990365..174994796	*MRPS14*	cg00981945	chr1:173977793	*RC3H1*	2	1.20×10^{-12}
chr3:49392855..49397942	*RHOA*	cg09665691	chr3:47563885	*SCAP*	3	2.89×10^{-12}
chr11:46408921..46416687	*CHRM4*	cg09580214	chr11:47448534	*PSMC3*	5	4.54×10^{-12}
chr11:47268234..47272633	*NR1H3*	cg04721828	chr11:48285200	*OR4X1*	5	4.56×10^{-12}
chr11:57100841..57105430	*SSRP1*	cg26831825	chr11:55541269	*OR5D13*	6	5.13×10^{-12}
chr1:173443978..173449105	*PRDX6*	cg02482603	chr1:174843754	*RABGAP1L*	12	8.14×10^{-12}
chr6:31800598..31804823	*C6orf48*	cg10154826	chr6:17600994	*FAM8A1*	18	8.18×10^{-12}

Supplementary Table 13: Trans-effects for CpG Islands & Shores (MAF ≤ 1%)

CpG Islands & Shores	Nearest Gene	Probe	Probe location	Nearest Gene to Probe	nVars	P-value
chr6:71996106..72001109	*OGFRL1*	cg05891823	chr19:9938431	*UBL5*	7	2.95×10^{-14}
chr2:179313214..179318573	*PRKRA*	cg05098815	chrY:9449618	*RBMY3AP*	7	5.49×10^{-14}
chr22:46608124..46612789	*PPARA*	cg03601053	chrY:15016101	*DDX3Y*	2	6.26×10^{-14}
chr19:9783480..9787806	*ZNF562*	cg02900749	chr2:68251473	*NA*	3	1.32×10^{-13}
chr3:47321747..47326607	*KIF9*	cg06360465	chr3:50341183	*HYAL1*	3	3.01×10^{-13}
chr3:48280425..48284817	*ZNF589*	cg26928789	chrY:22682393	*TTTY10*	4	5.82×10^{-12}
chr6:71996106..72001109	*OGFRL1*	cg05891823	chr19:9938431	*UBL5*	2	6.47×10^{-12}
chr1:228360442..228364691	*IBA57*	cg12878555	chr12:6862401	*MLF2*	6	9.78×10^{-12}
chr20:60811371..60816247	*OSBPL2*	cg13062406	chr11:18813544	*PTPN5*	5	2.13×10^{-11}
chr19:47613253..47619101	*ZC3H4*	cg13899293	chr4:79175365	*FRAS1*	6	2.29×10^{-11}

Evaluations across time points

Supplementary Table 14: Evaluation of Cis-mQTLs using other time points in ARIES

			Birth (N=771)		Adolescence (N=837)		Pregnancy (N=764)		Middle Age (N=742)	
Region	**Nearest Gene**	**Probe**	**nVars**	**P-value**	**nVars**	**P-value**	**nVars**	**P-value**	**nVars**	**P-value**
CpG Island – MAF 5%										
chr3:142315171..142315567	*PLS1*	cg20824294	2	3.87E-08	2	2.92E-15	2	7.40E-15	2	6.74E-14
chr16:88883056..88883461	*GALNS*	cg00230183	5	4.17E-05	5	4.36E-09	5	1.77E-07	5	1.68E-07
chr16:67427284..67428950	*ZDHHC1*	cg27539214	5	1.34E-15	5	5.63E-13	5	2.71E-08	5	3.75E-12
chr2:241529962..241530345	*CAPN10*	cg26250154	2	3.76E-12	2	1.28E-11	2	3.06E-16	2	1.31E-14
chr16:67233032..67233862	*ELMO3*	cg08721338	2	1.52E-10	2	3.21E-16	2	1.79E-10	2	4.78E-07
CpG Island & Shores – MAF 5% (Top 10 Results only (out of 90))										
chr21:45728220..45732444	*PFKL*	cg21069494	6	9.34E-20	6	1.63E-18	6	2.15E-18	6	2.39E-20
chr8:144715866..144720798	*ZNF623*	cg16316162	3	5.72E-22	3	2.62E-19	3	1.29E-23	3	3.73E-28
chr11:66492937..66498387	*SPTBN2*	cg24851651	6	1.06E-12	6	7.04E-17	6	4.52E-12	6	1.76E-11
chr2:75785717..75790312	*EVA1A*	cg26175789	8	3.27E-14	8	1.08E-20	9	7.24E-19	9	5.47E-18
chr12:120753346..120757672	*PLA2G1B*	cg06379361	5	3.99E-20	5	8.86E-16	5	3.66E-19	5	6.11E-21
chr7:100873555..100878212	*CLDN15*	cg01299997	7	4.08E-22	7	3.75E-15	6	1.96E-12	6	3.33E-19
chr3:53076956..53083101	*RFT1*	cg04865290	10	1.34E-12	10	6.69E-24	10	3.82E-22	10	1.99E-13

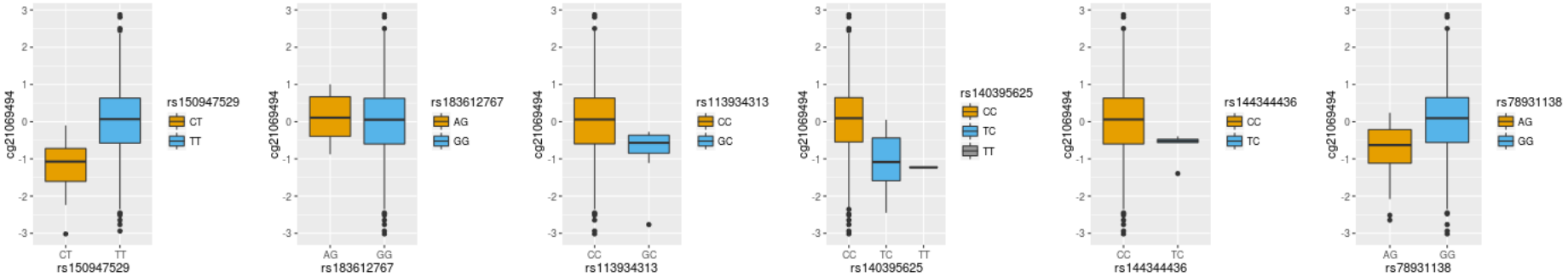
chr2:196519555..196524950	*SLC39A10*	cg19655195	8	1.25E-14	8	1.68E-18	8	1.84E-15	8	6.86E-16
chr1:1287707..1293126	*MXRA8*	cg17132079	3	2.99E-13	3	4.02E-20	3	1.06E-14	3	4.54E-14
chr11:64407877..64413253	*NRXN2*	cg19395706	4	7.53E-14	4	3.00E-16	3	5.63E-17	3	7.56E-23
CpG Island & Shores – MAF 1%										
chr2:233243999..233248448	*ALPP*	cg16700265	3	$3.09x10^{-09}$	3	$3.08x10^{-14}$	3	$1.08x10^{-11}$	3	$7.41x10^{-15}$
CpG Island, Shores & Shelves – MAF 5% (Top 10 Results only (out of 37))										
chr1:155260318..155269536	*PKLR*	cg08949192	12	1.43E-12	12	3.04E-18	12	3.26E-27	12	1.90E-21
chr8:144713866..144722798	*ZNF623*	cg16316162	4	3.10E-22	4	2.30E-19	5	4.06E-24	5	3.55E-28
chr10:835608..844210	*LARP4B*	cg10556349	9	9.82E-18	9	1.23E-21	9	1.86E-20	9	1.57E-18
chr21:45726220..45734444	*PFKL*	cg21069494	8	8.83E-17	8	5.10E-16	8	1.13E-18	8	2.86E-20
chr16:67139282..67147827	*C16orf70*	cg00510320	9	1.39E-22	9	2.37E-21	10	4.45E-18	10	9.94E-19
chr3:53074956..53085101	*RFT1*	cg04865290	14	1.36E-12	14	1.85E-24	14	2.10E-22	14	2.18E-13
chr21:48083200..48092106	*PRMT2*	cg24877093	13	8.83E-17	13	6.64E-20	13	3.73E-14	13	3.52E-14
chr11:47611710..47620055	*C1QTNF4*	cg04721828	10	1.02E-11	10	2.27E-16	10	1.54E-13	10	3.59E-11
chr2:128346285..128354640	*MYO7B*	cg01966334	12	3.13E-07	12	1.44E-20	12	4.86E-19	12	1.23E-15
chr2:196517555..196526950	*SLC39A10*	cg19655195	14	4.80E-13	14	3.64E-18	14	4.20E-15	14	9.42E-15

Supplementary Table 15: Evaluation of Trans-mQTLs using other time points in ARIES

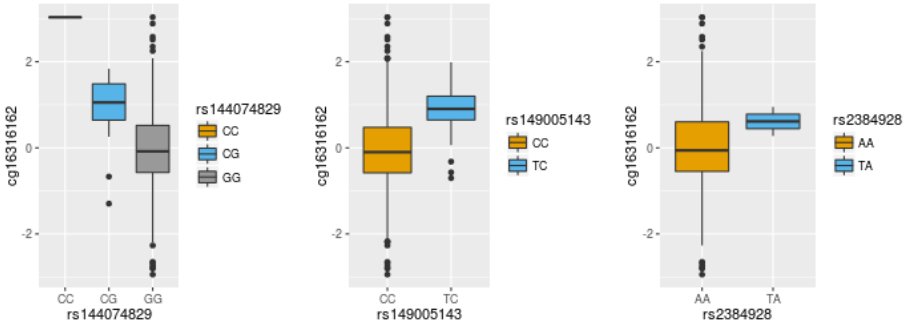
			Birth (N=771)		Adolescence (N=837)		Pregnancy (N=764)		Middle Age (N=742)	
Region	**Nearest Gene**	**Probe**	**nVars**	**P-value**	**nVars**	**P-value**	**nVars**	**P-value**	**nVars**	**P-value**
CpG Island & Shore – MAF 5%										
chr21:33982367..33987450	*C21orf59*	cg09050820	9	3.67×10^{-15}	9	1.14×10^{-15}	9	1.54×10^{-10}	9	4.32×10^{-14}

Supplementary Figure 1: Box & Whisker plots for CpG Island & Shores cis-effects

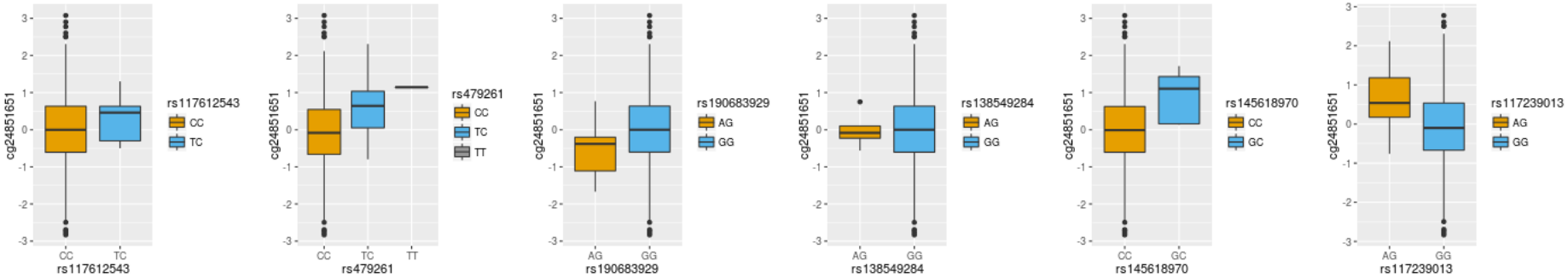
a) *PFKL*



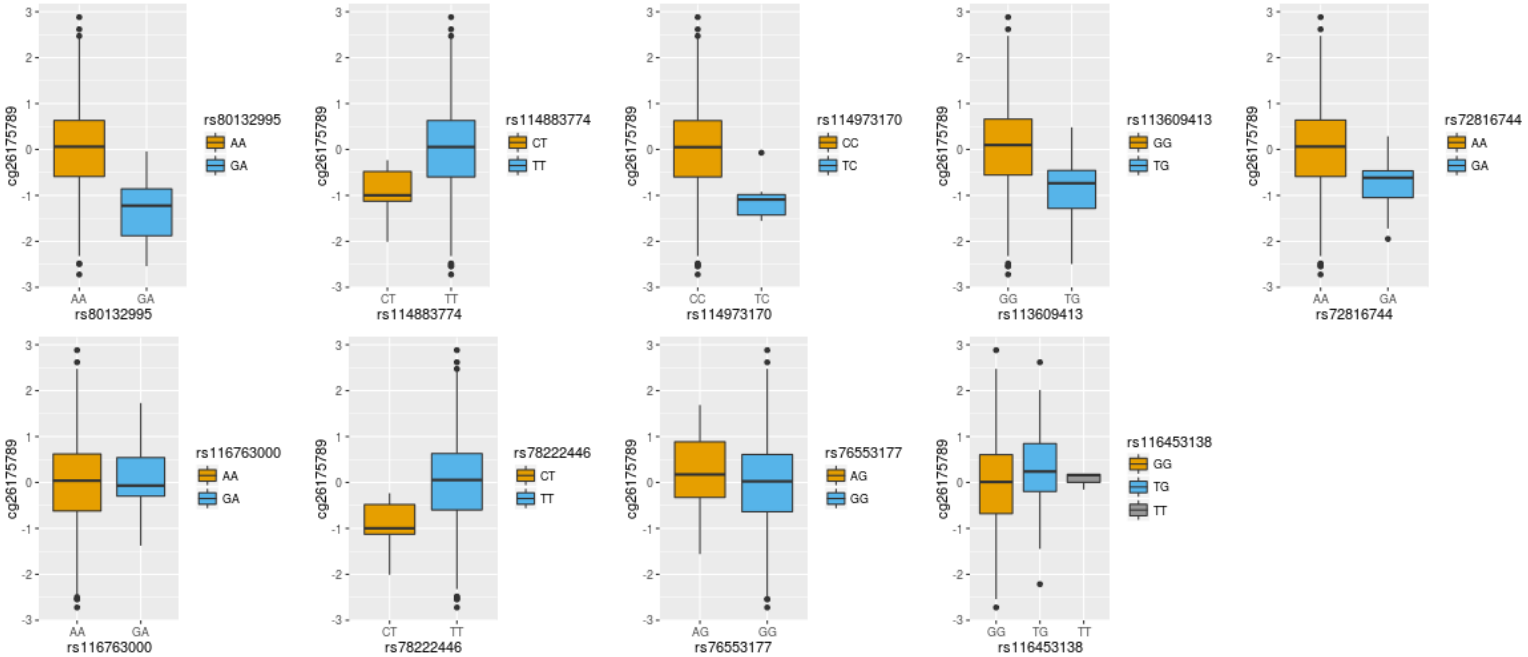
b) *ZNF623*



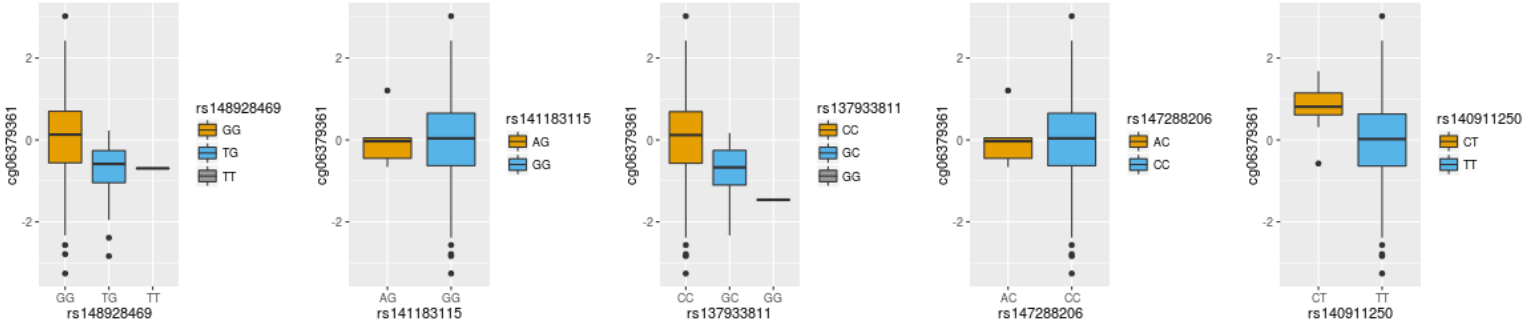
c) *SPTBN2*



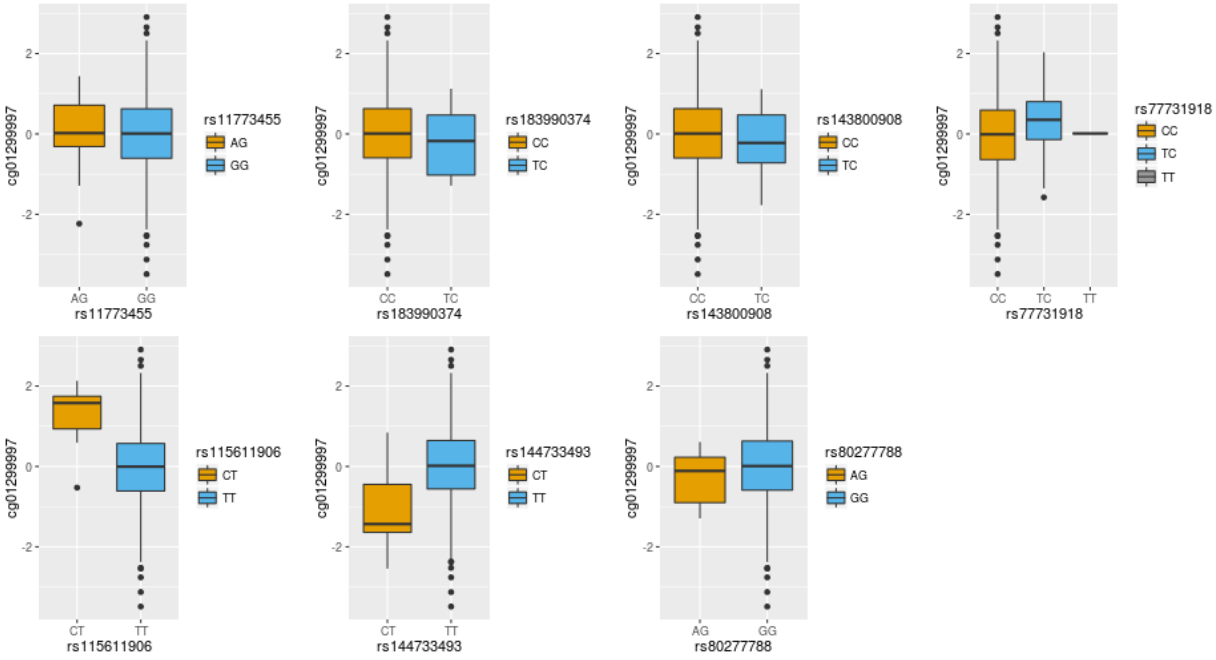
d) *EVA1A*



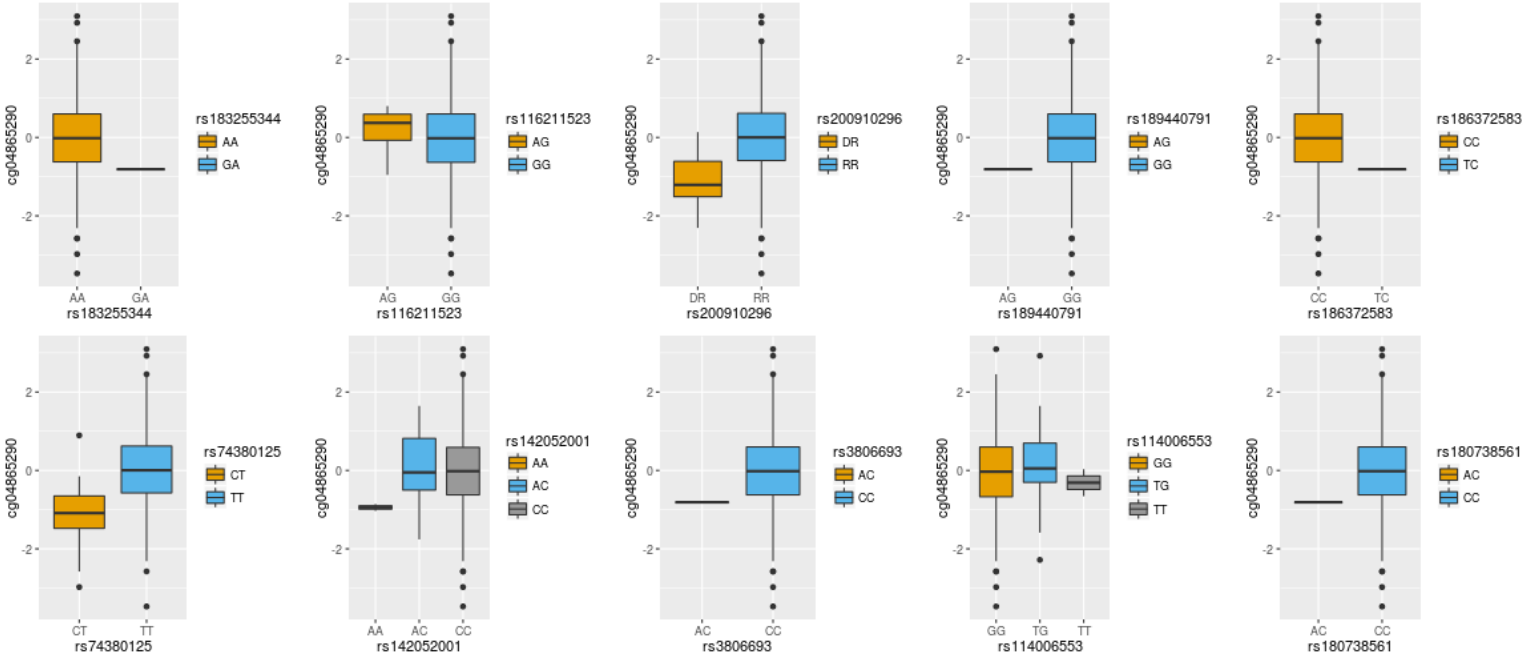
e) *PLA2G1B*



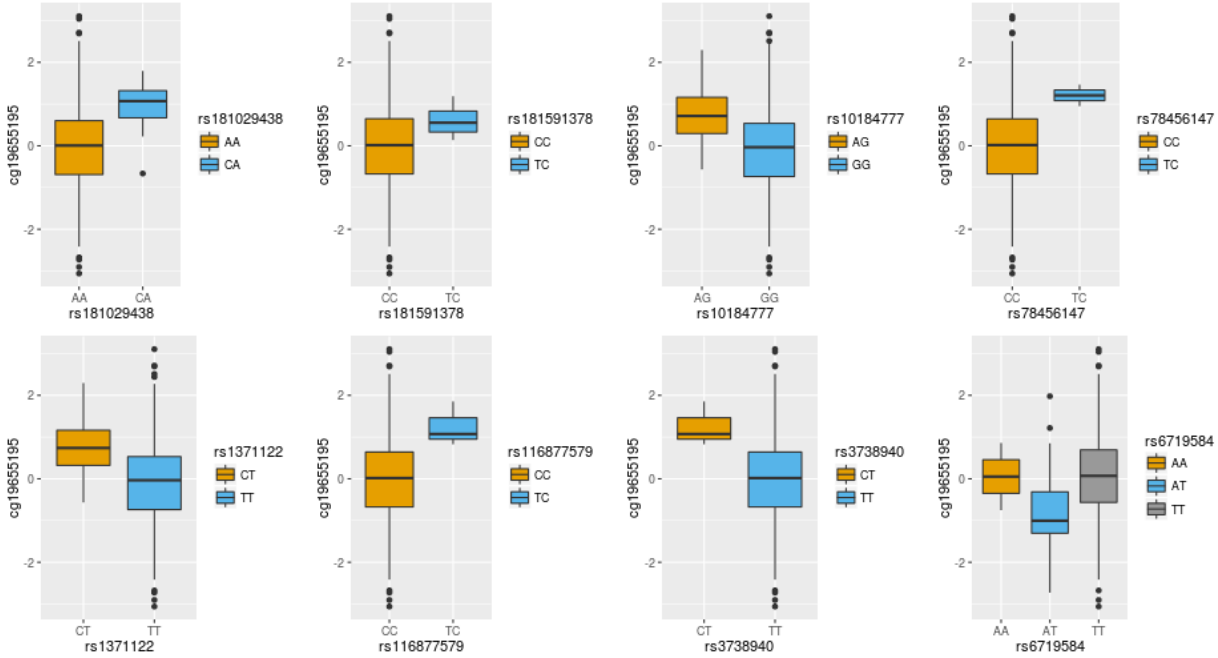
f) *CLDN15*



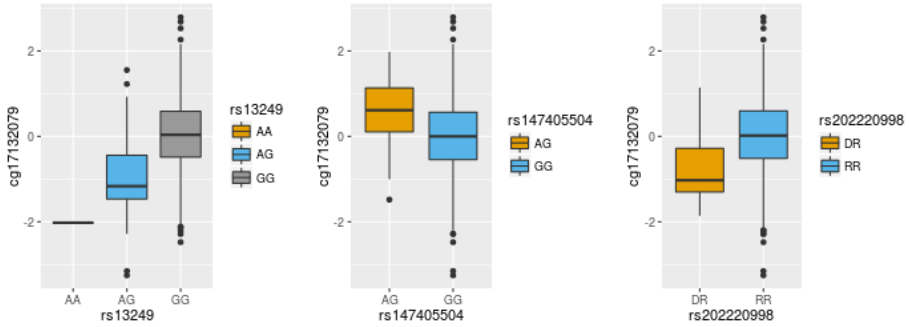
g) *RFT1*


cg04865290
rs183255344
AA
GA
rs116211523
AG
GG
rs200910296
DR
RR
rs189440791
AG
GG
rs186372583
CC
TC
rs74380125
CT
TT
rs142052001
AA
AC
CC
rs3806693
AC
CC
rs114006553
GG
TG
TT
rs180738561
AC
CC

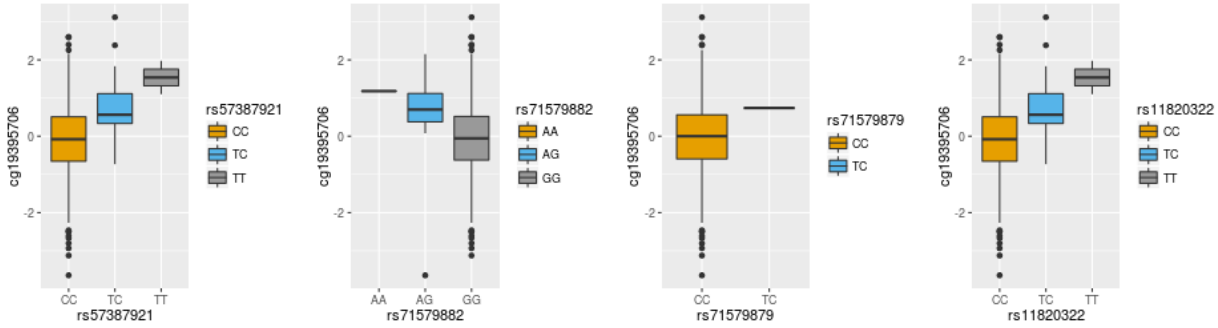
h) *SLC39A10*



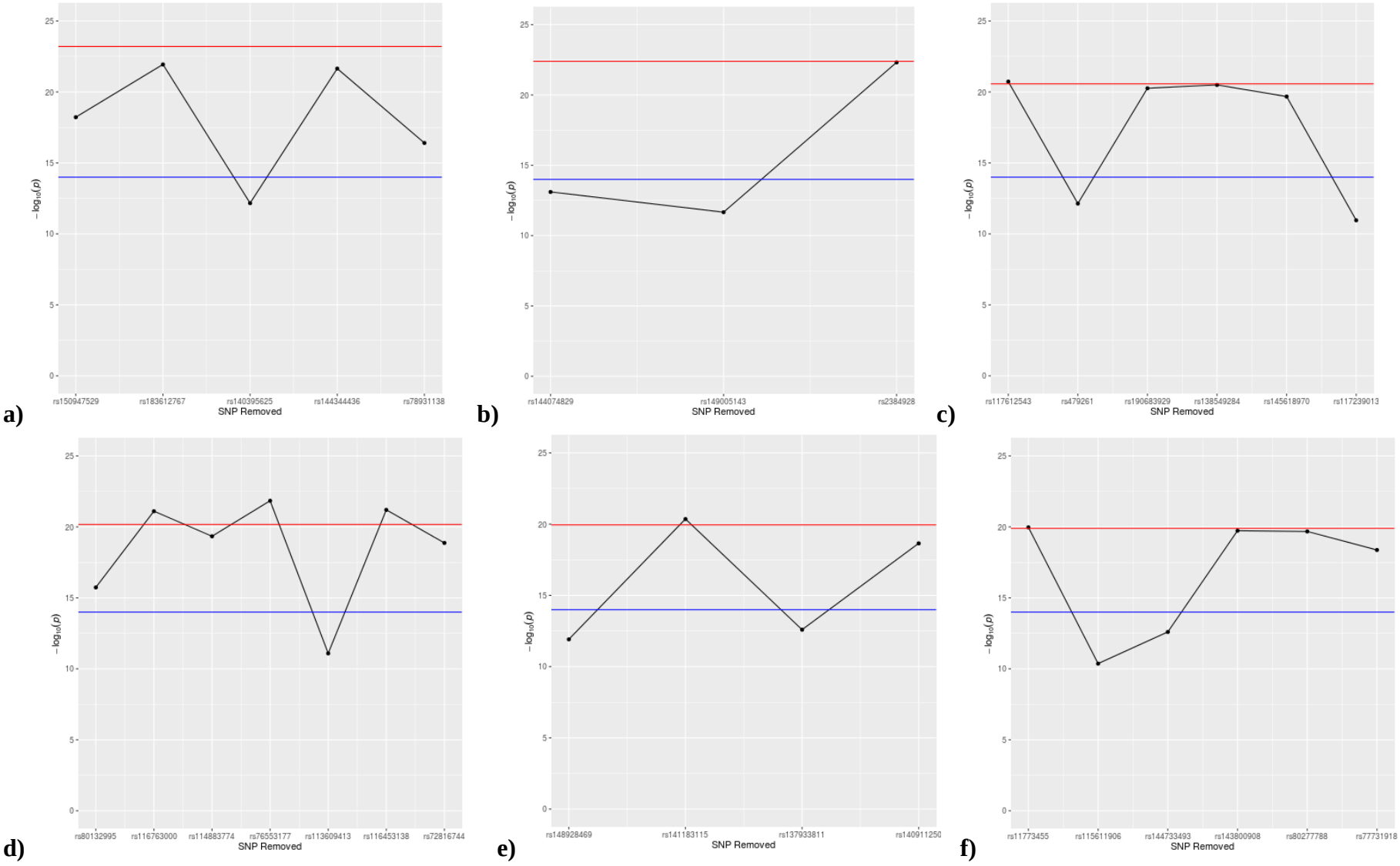
i) *MXRA8*



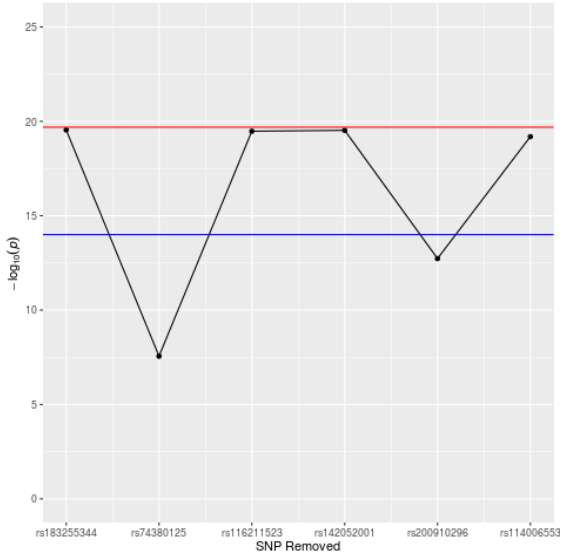
j) *NRXN2*



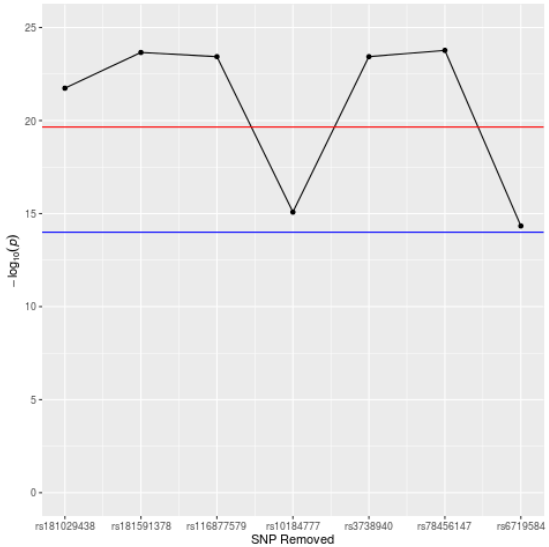
Supplementary Figure 2: Leave-One-Out Analysis for CpG Island & Shores cis-effects



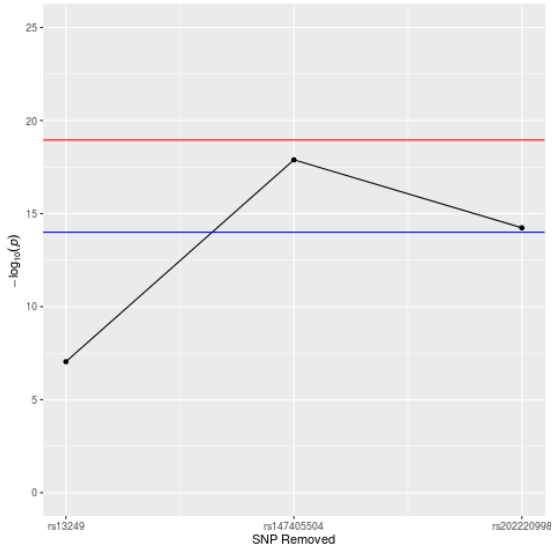
g)


25
20
15
10
5
0
$-\log_{10}(p)$
rs183255344
rs74380125
rs116211523
rs142052001
rs200910296
rs114006553
SNP Removed

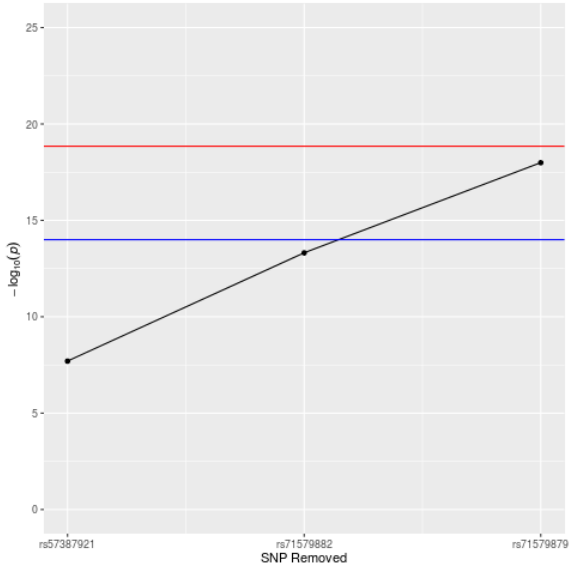
h)


25
20
15
10
5
0
$-\log_{10}(p)$
rs181029438
rs181591378
rs116877579
rs10184777
rs3738940
rs78456147
rs6719584
SNP Removed

i)


25
20
15
10
5
0
$-\log_{10}(p)$
rs13249
rs147405504
rs202220998
SNP Removed

j)


25
20
15
10
5
0
$-\log_{10}(p)$
rs57387921
rs71579882
rs71579879
SNP Removed

- Red line = observed p-value according to SKAT when analysing all variants at this mQTL (prior to pruning)
- Blue line = threshold used in our study (i.e. 1.0×10^{-14})
- Each plot resembles one of the top 10 hits from our study at the following loci a) *PFKL* b) *ZNF623* c) *SPTBN2* d) *EVA1A* e) *PLA2G1B* f) *CLDN15* g) *RFT1* h) *SLC39A10* i) *MXRA8* j) *NRXN2*

Supplementary Table 16: Results from Conditional analysis at previously discovered mQTL loci

Conditional analysis results						Single Variant mQTL results		
Region	**Nearest Gene**	**Probe**	**nVars05**	**P-value05**	**Timepoints_collapse**	**SNP**	**P-value**	**Timepoints_single**
chr2:208974900..208979396	*C2orf80*	cg10392614	5	2.56×10^{-20}	ALL	rs28575061	1.36×10^{-169}	ALL
chr20:37350130..37359372	*SLC32A1*	cg15490840	5	2.88×10^{-20}	F7	rs10932241	1.64×10^{-17}	15up
chr8:26045804..26050097	*PPP2R2A*	cg12285565	3	1.16×10^{-18}	ALL	rs2867326	1.00×10^{-19}	cord, F7, 15up, ante
chr16:1003902..1008281	*LMF1*	cg07338658	5	3.34×10^{-13}	-	rs111820009	1.06×10^{-33}	ALL
chr19:41302467..41307050	*RAB4B*	cg11298343	5	6.32×10^{-12}	-	rs111833532	9.61×10^{-50}	ALL
chr3:13321438..13326929	*NUP210*	cg05265484	3	8.54×10^{-12}	-	rs36024363	1.77×10^{-43}	ALL
chr2:1799618..1804060	*MYT1L*	cg04722030	9	1.17×10^{-11}	-	rs13387965	1.43×10^{-20}	F7, 15up
chr13:111299316..111303593	*CARS2*	cg15747390	18	1.22×10^{-11}	-	rs61970542	5.87×10^{-97}	ALL
chr3:112928437..112933506	*BOC*	cg23260991	3	1.56×10^{-11}	-	rs931702	7.48×10^{-16}	FOM
chr1:91187139..91191400	*BARHL2*	cg22507154	4	1.42×10^{-10}	-	rs72720396	8.12×10^{-25}	F7, 15up, ante, FOM

nVars05 = number of variants analysed (MAF≤5%), P-value05 = SKAT p-value conditioned on single variant mQTL at this loci (MAF≤5%), SNP = mQTL variant at this loci associated with methylation from probe in single variant analysis, P-value = single variant p-value between SNP and probe from single variant analysis, Timepoints collapse = Time points where results from the conditional analyses had a p-value < 1×10^{-14}, Timepoints_single = Time points where results from single variant analysis had a p-value < 1×10^{-14}. Where multiple time points are reported, the p-value from the time points with the largest sample size is presented.